

CLAIMS

1. A process for the extrusion of a cementitious green body from a paste of suspension of cementitious particulate material in a liquid, wherein the process includes the steps of:
 - (a) supplying the cementitious paste or suspension at a low pressure of less than 20 bar to, and thereby filling at the low pressure, an extrusion chamber of an extruder having a piston operable in said chamber;
 - (b) applying by means of the piston a high pressure of at least 80 bar to the paste or suspension on completion of step (a) whereby the paste or suspension is forced from the extrusion chamber and through a molding spaced with a dewatering section defined by at least partially liquid-permeable walls; and
 - (c) removing a substantial part of the liquid by the high pressure applied in step (b)
 - establishing a pressure differential across at least parts of said wall that are permeable to said liquid to form and maintain a non-flowable shaped body of said particulate material to bring dewatered paste to a final shape for the green body; and
- wherein the extrusion chamber has substantially the same principle cross sectional geometry or form as the final product and the piston by which the suspension is pressurized has the same cross sectional geometry as the final product for fitting into the extrusion chamber.
2. The process of claim 1, wherein the paste or suspension experiences substantially only cross sectional reductions in its flow through the extrusion chamber towards the dewatering section; and wherein the cross sectional area of the extrusion chamber is larger than the cross-section of the extruded body.
3. The process of claim 2, wherein the reduction is from 1:3 and 1:6
5. The process of any one of claims 1 to 4, wherein supplying the paste of suspension in step (a) is through at least one inlet port to the extrusion chamber placed at or close to the end of the extrusion chamber through which the paste or suspension is forced during the extrusion of step (b).

6. The process of any one of claims 1 to 5, wherein supplying the paste or suspension in step (a) is through at least one inlet port located where the piston head is positioned on completion of an extrusion stroke and emptying of the extrusion chamber.

7. The process of claim 6, wherein high pressure is applied to the paste or suspension in step (b) by a leading face of the piston head which is inclined with respect to the line of movement of the piston.

8. The process of claim 7, wherein the inclination is such that, on completion of an extrusion stroke, a flow of paste or suspension for filling the extrusion chamber in step (a) for a next stroke, or part of a stroke, sweeps across the leading face of the piston.

9. The process of claim 8, wherein filling of the extrusion chamber in each step (a) causes or assists in movement of the piston to a retracted position.

10. The process of any one of claims 1 to 9, wherein the low pressure at which step (a) is conducted is less than 10 bar.

11. The process of any one of claims 1 to 10, wherein the high pressure applied to the paste or suspension in step (b) is from 80 to 240 bar.

12. The process of claim 11, wherein the high pressure applied is from 100 to 180 bar.

13. An apparatus for use in the extrusion of a cementitious green body from a cementitious paste or suspension of particulate material in a liquid, wherein the apparatus includes:

- an extrusion chamber;
- a piston for pressurizing the extrusion chamber;
- a molding space with a dewatering section defined by at least partially liquid-permeable walls;
- means for supplying the paste or suspension to and filling the extrusion chamber

at a low pressure of less than 20 bar; and

- means for moving the piston for applying a high pressure of at least 80 bar to the

paste or suspension in the extrusion chamber and forcing the paste or suspension from the extrusion chamber and through the molding space, and thereby remove a substantial part of the liquid by establishing a pressure

and differential across at least parts of said wall permeable to said liquid to form
the maintain a non-flowable shaped body of said particulate material and bring

dewatered paste or suspension to a final shape for the green body; and wherein the extrusion chamber has the same principle cross sectional geometry or form as the final product and wherein the piston has the same cross sectional geometry as the final product for fitting into the extrusion chamber.
14. The apparatus of claim 13, wherein the extrusion chamber is operable to cause the paste or suspension to experience only cross sectional reductions in flow through the extrusion chamber towards the dewatering section, and wherein the cross sectional area of the extrusion chamber is larger than the cross-section of the extruded body.

15. The apparatus of claim 14, where in the extrusion chamber is operable to cause the paste or suspension to undergo a cross section reduction of between 1:2 and 1:10.

16. The apparatus of claim 15, wherein the reduction is from 1:3 and 1:6.
17. The apparatus of any one of claims 13 to 16, wherein the means for supplying the paste or suspension includes at least one inlet port to the extrusion chamber placed at or close to the end of the extrusion chamber through which the suspension is forced by said means for applying high pressure.

18. The apparatus of any one of claims 13 to 17, wherein the means for supplying the paste or suspension includes at least one inlet port located where the piston head is positioned on completion of an extrusion stroke and emptying of the extrusion chamber.

19. The apparatus of claim 18, wherein the means for applying a high pressure is applied to the paste or suspension in step (b) by a leading face of the piston head which is inclined with respect to the line of movement of the piston.

20. The apparatus of claim 19, wherein the inclination is such that, on completion of an extrusion stroke, a flow of paste or suspension for filling the extrusion chamber for a next stroke, or part of a stroke, sweeps across the leading face of the piston.
21. The apparatus of claim 20, wherein the means for supplying the paste or suspension is adjusted to cause or assist in movement of the piston to a retracted position.

22. The apparatus of any one of claims 13 to 21, wherein the supplying means is operable to supply the paste or suspension at a pressure less than 10 bar.
23. The apparatus of any one of claims 13 to 22, wherein the pressure applying means is operable to force the paste or suspension at a pressure of from 80 to 240.
24. The apparatus of claim 23, wherein the pressure applying means is operable to force the paste or suspension at a pressure of from 100 to 180 bar.